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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,086	10/21/2005	Shingo Hishiya	33082M287	2876
441 7590 06/16/2009 SMITH, GAMBRELL & RUSSELL 1130 CONNECTICUT AVENUE, N.W., SUITE 1130 WASHINGTON, DC 20036			EXAMINER CHEN, BRET P	
			ART UNIT 1792	PAPER NUMBER
			MAIL DATE 06/16/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/554,086

Applicant(s)

HISHIYA, SHINGO

Examiner

Bret Chen

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2009.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5-7 and 9-16 is/are pending in the application.
4a) Of the above claim(s) 9-16 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1 and 5-7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 21 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claims 1, 5-7, 9-16 are pending in this application. Amended claims 1, 5-7 and canceled claims 2-4, 8 are noted.

The amendment dated 3/19/09 has been entered and carefully considered. The examiner appreciates the amendments to the abstract, title, and claims. In view of said amendments, the objections, 112 rejection, and the previous art rejection have been withdrawn.

Claims 9-16 have been withdrawn from consideration as being directed to a nonelected invention.

Applicant requested notification that the drawings have been accepted (p.7 first paragraph). The drawings were accepted as indicated in the previous office action and this one as well.

Applicant also notes an IDS filed 12/17/08 (p.7 second paragraph). At the present time, there is no such IDS present in the application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue (5,976,966) in view of Murakami et al. (2003/0087042) and JP 8-115976. Inoue discloses a method of forming an insulating film by CVD on the surface of a semiconductor substrate formed with circuit elements such as transistors, and thereafter forming a hydrogen silsesquioxane resin film on the insulating film by spin-coating or the like followed by heat treatment steps (col.2 lines 30-52). This resin film is sequentially subjected to low temperature annealing at 400°C or lower and then to high temperature annealing at 700°C or higher (col.4 lines 6-28). It is specifically noted that the low temperature annealing changes the resin film into a silicon oxide film, and the high temperature annealing is performed in order to make dense the film quality of the silicon oxide film (col.2 line 53 - col.3 line 7). It is the examiner's position that this meets the limitation of modifying a surface. The high temperature annealing is performed by rapid thermal annealing in an oxidizing atmosphere of water vapor or the like (col.4 lines 22-28). However, the reference fails to teach applying a solution to form the interlayer insulating film.

Murakami discloses of forming a porous silicon oxide film for use as an interlayer insulating film by preparing an organic silane solution containing an organic silane, water and an alcohol, subjecting the organic silane to acid hydrolysis or alkali hydrolysis and then heat-treating the resulting reaction system in the presence of a surfactant to thus form the film (0011). It should be noted that an alternative method for forming the porous silicon oxide film is to use CVD or sputtering (0014). It is noted that Murakami fairly teaches the conventionality of forming a porous silicon oxide film by using an organic silane solution of by CVD. It would

have been obvious to utilize the organic solution for the CVD process in Inoue with the expectation of obtaining similar results.

In addition, Inoue and Murakami both fail to teach an oxidizing gas which is a mixed gas of hydrogen and oxygen. JP'976 teaches of forming an interlayer insulating film in which the oxidizing gas comprises hydrogen and oxygen (constitution). It would have been obvious to substitute the oxidizing gas comprising hydrogen and oxygen for the water vapor of Inoue with the expectation of obtaining similar results because JP'976 teaches the conventionality of using an oxidizing gas comprising hydrogen and oxygen.

Regarding claims 5-6, the applicant requires a specific surface energy and surface contact angle, respectively. While it is noted that the feature is not explicitly taught by the references above, this limitation is inherently met because the references teach the claimed method steps.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue (5,976,966) in view of Murakami et al. (2003/0087042) and JP 8-115976 and further in view of Suemasa et al. (6,670,276). The combination of Inoue/Murakami/JP'976 discloses a method of forming an insulating film by CVD applying a solution to form the interlayer insulating film using a mixed gas of hydrogen and oxygen as noted above. However, the references fail to teach polysiloxane having an organic functional group.

Suemasa discloses a plasma processing method in which an insulating film is formed (col.1 lines 28-39) using a polysiloxane having an organic functional group with the expressed purpose of obtaining a low dielectric constant (col.2 lines 20-41). It would have been obvious to

utilize Suemasa's polysiloxane in the process of Inoue/Murakami/JP'976 with the expectation of obtaining a low dielectric constant as taught by Suemasa.

Response to Arguments

Applicant's arguments with respect to claims above have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that the references fail to teach an oxidizing gas is a mixed gas of hydrogen and oxygen (p.8 third paragraph) and a polysiloxane.

The examiner agrees. A new ground of rejection has been set forth.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1792

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bret Chen whose telephone number is (571)272-1417. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bret Chen/

Primary Examiner, Art Unit 1792

6/15/09